

NORTHWEST TERRITORIES WATER BOARD

**ONSHORE OIL AND GAS
EXPLORATION DRILLING
QUESTIONNAIRE**

FOR

WATER LICENCE APPLICATIONS

**Prepared by:
Department of Indian Affairs and Northern Development
Water Resources Division
August 1999
Version 5.07**

Introduction

The purpose of this questionnaire is to solicit supplemental information from an applicant to support their application for a water licence (or renewal). It is anticipated that the completion of this questionnaire will reduce delays arising from the Northwest Territories Water Board having to solicit additional information after an application has already been submitted. This information will also be useful during the environmental assessment and screening of your application, which must be undertaken prior to development and approval of a water licence.

The applicant should complete the questionnaire to the best of his/her ability, recognizing that some questions may not be relevant to the project under consideration. For questions that do not relate to his/her operation, the applicant is requested to indicate "N/A" (Not Applicable).

If any questions arise while completing the questionnaire, the applicant may wish to contact the Northwest Territories Water Board at (867) 669-2772. If your question is that of a technical nature please contact the Regulatory Approvals Section of the Water Resources Division, Department of Indian Affairs and Northern Development (INAC), at (867) 669-2651.

Chairman,
Northwest Territories Water Board

TABLE OF CONTENTS

SECTION	PAGE
1. PRELIMINARY SITE ASSESSMENT	1
2. WATER USE AND WASTE DISPOSAL	4
3. CONTINGENCY, ABANDONMENT AND RESTORATION PLANNING	6
4. ENVIRONMENTAL ASSESSMENT AND SCREENING	7
5. LIST OF ATTACHMENTS	9

If space is insufficient for any of the responses on this questionnaire, use the back of the sheet or attachments.

List attachments in Appendix 1.

Print or type your responses.

SECTION 1:

PRELIMINARY SITE ASSESSMENT

DATE: August 1, 2002

1.1 APPLICANT

COMPANY NAME: Petro-Canada

ADDRESS: 150 - 6th Avenue S.W.
Calgary, Alberta T2P 3E3

PROPERTY NAME/EXPLORTION LIC. #: EL 406

CLOSEST COMMUNITY: Tuktoyaktuk

LATITUDE/LONGITUDE OF WELL CENTRE (Degrees, minutes, seconds):
69° 05' to 69° 09'N 133° 17' to 134° 20'W

1.2 PRIMARY COMPANY CONTACT:

NAME: John Kerkhoven

TITLE: Supervisor, Surface Land

CONTACT NUMBER: 403-296-6345

ALTERNATE CONTACT NUMBERS: 403-804-2387 (cell)

1.3 FIELD CONTACT:

NAME (If known): _____

TITLE (If known): _____

CONTACT NUMBER: _____

1.4 INDICATE THE STATUS OF THIS APPLICATION:

NEW APPLICATION ☒ RENEWAL ☐

IF RENEWAL, INCLUDE LICENCE NUMBER: _____

1.5 SITE HISTORY

INDICATE IF THIS SITE CONTAINS ANY KNOWN: _____

FORMER WELL SITES	<u>No</u>
WASTE DUMPS	<u>No</u>
FUEL AND CHEMICAL STORAGE AREAS	<u>No</u>
SUMP AREAS	<u>No</u>
WASTE WATER DISCHARGE LOCTIONS	<u>No</u>

DESCRIBE SITES AND REFERENCE THEM ON THE MAP IN QUESTION 1.6

Please refer to the map in the pocket of the attached project description.

1.6 ATTACH MAPS DRAWN TO SCALE SHOWING LOCATIONS OF EXISTING AND PROPOSED:

CAMP FACILITIES,
WELL SITE(S),
SUMPS,
WATER SOURCES,
FUEL AND CHEMICAL STORAGE FACILITIES,
DRILLING MUD STORAGE FACILITIES,
DRAINAGE CONTROLS,
TRANSPORTATION ROUTES (SEASONAL AND ALL WEATHER)*,
ELEVATION CONTOURS,
LOCATIONS OF WATERBODIES
DRAINAGE PATTERNS FOR WELL AND CAMP SITES.

Please refer to the map in the pocket of the attached project description.

1.7 DESCRIBE THE PROPOSED OR CURRENT METHOD OF FRESHWATER WITHDRAWAL, THE TYPE AND OPERATING CAPACITY OF THE PUMPS USED AND THE INTAKE SCREEN SIZE.

Water will be withdrawn from various lakes and the Mackenzie River with a maximum withdrawal of 1000 m³/day, during access and wellsite construction. For drilling purposes, Lake #42 and/or #34 will likely be utilized. Lakes to be used for water withdrawal are identified on the map in the pocket of the attached project description. Volume and withdrawal estimates for each lake identified are listed in Appendix C of the project description. Petro-Canada has engaged in early discussions with DFO in regards to source lake volumes. Water intake hoses will be fitted with screens of such size to prevent impingement or entrainment of fish.

- 1.8 ESTIMATE MAXIMUM DRAW DOWN AND RECHARGE CAPABILITY OF THE RIVER OR LAKE FROM WHICH FRESH WATER WILL BE DRAWN. QUOTE DRAW DOWN IN CENTIMETRES, OR, STATE PERCENTAGE OF FLOW WITHDRAWN.

Volume and withdrawal estimates for water sources are listed in Appendix C of the attached project description.

- 1.9 INDICATE IF PERMAFROST IS EXPECTED TO BE ENCOUNTERED UNDER:

CAMP FACILITIES	<u>Yes</u>
WELL SITE	<u>Yes</u>
ACCESS ROUTES	<u>Yes</u>
SUMPS	<u>Yes</u>
OTHER	<u> </u>

- 1.10 INDICATE ANY POTENTIAL FOR ENCOUNTERING ARTESIAN AQUIFERS OR LOST CIRCULATION WITHIN THE SURFACE HOLE (TO CASING DEPTH)

N/A

- 1.11 ATTACH A DESCRIPTION OF THE SURFICIAL GEOLOGIC AND HYDRO-GEOLOGIC CONDITIONS IN THE IMMEDIATE VICINITY OF THE WELLSITE

The surficial geology of the proposed program area consists of fine and coarse grained river deposits; thermokarst lakebeds; gravelly and sandy hills, rivers and terraces; and hummocky till-capped terrain (GSC 1987). The sedimentary succession has been extensively deformed by Tertiary faulting and folding resulting in structural elements including variably oriented anticlines and thrust faults, and east- and north-east trending extensional faults (Lane and Dietrich 1995). The hydrocarbon-bearing sequence of the Mackenzie Delta has been identified as an upper layer of weakly consolidated sandstone and conglomerate, and includes the uppermost Quaternary sediments of the area. Underlying this is a layer of primarily fine-grained siltstone and shale.

The Tuktoyaktuk Coastal Plain is strewn with a large number of typically shallow lakes. A large proportion of these lakes were formed during a postglacial warm period when active layer depths resulted in thawing of the upper, ice-rich, permafrost layers (Mackay 1992). The southwestern extent of the Husky Lakes estuary is located within the vicinity of the proposed program area (app. 5 km from south drilling area). The estuary is connected to the Beaufort Sea via Liverpool Bay and represents varying degrees and stratification of salinity and temperature, dependent on freshwater inputs via watershed drainage and ice melt as well as tides, storm surges, and other flow dynamics derived from the Beaufort Sea.

SECTION 2:

WATER USE AND WASTE DISPOSAL

- 2.1 OUTLINE ALL WATER USAGE IN THE DRILL PROGRAM, CAMP FACILITIES, AND ROAD CONSTRUCTION. INDICATE THE SOURCE AND VOLUME OF WATER FOR EACH USE.

	Source	Use	Average Volume (m ³ /day)
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____

TOTAL:

A complete list of water sources, volumes and withdrawal estimates is located in Appendix C of the attached project description. The map in the pocket of the project description identifies the location of the water sources. Water requirements are also discussed in Section 4.2.4 of the project description.

- 2.2 WILL DRILLING WASTES CONTAIN DETRIMENTAL SUBSTANCES INCLUDING, BUT NOT LIMITED TO, OIL BASED OR INVERT MUDS AND HIGH SALINITY FLUIDS?

YES X NO _____

IF YES, INDICATE SUBSTANCES:

Petro-Canada proposes to drill the well sites using a KCL (potassium chloride) drilling mud system. The KCL system is a mixture of potassium chloride, bentonite, and XC polymer and has been used by Petro-Canada on the recent M-15 and L-46 wells in the Mackenzie Delta. The use of saline inhibitive muds is primarily restricted to areas where water sensitive formations are exposed for prolonged periods of time or where water sensitive producing formations are encountered. Appendix B of the attached project description contains a complete list of products to be stored on-site.

- 2.3 INDICATE THE TOTAL ESTIMATED VOLUME OF DRILLING WASTES

Approximately 2100 CUBIC METRES/ well site

- 2.4 INDICATE METHODS FOR DISPOSAL OF DRILLING WASTES.

 Yes SUMP
_____ DOWN HOLE (REQUIRES NEB APPROVAL)
_____ ON-SITE TREATMENT (PROVIDE PLAN)
_____ OFF-SITE (GIVE LOCATION AND METHOD OF DISPOSAL)

2.5 IF A SUMP IS BEING USED, ATTACH THE FOLLOWING INFORMATION

SCALE DRAWINGS AND DESIGN OF SUMPS,
CAPACITY IN CUBIC METRES,
BERM EROSION PROTECTION,
SOIL PERMEABILITY AND TYPE
RECYCLING/RECLAIMING WATERS,
SURFACE DRAINAGE CONTROLS,
ABANDONMENT PROCEDURES.

Please refer to *Section 4.2.6 Drilling Waste Disposal* and *Section 14.0 Cleanup, Reclamation, Disposal, and/or Decommissioning Plan*.

2.6 WILL A CAMP BE PROVIDED?

YES

X

NO

☐

2.7 IF YES, THEN INDICATE THE CAPACITY AND THE EXPECTED MAXIMUM NUMBER OF PERSONS THAT WILL BE ACCOMMODATED.

CAPACITY

60-80

PERSONS

MAXIMUM ACCOMMODATED

~45

PERSONS

SECTION 3:

CONTINGENCY, ABANDONMENT AND RESTORATION PLANNING

- 3.1 ATTACH THE PROPOSED OR EXISTING CONTINGENCY PLAN WHICH DESCRIBES COURSE OF ACTION, MITIGATIVE MEASURES AND EQUIPMENT AVAILABLE FOR USE IN THE EVENT OF SYSTEM FAILURES AND SPILLS OF HAZARDOUS MATERIALS (IN COMPLIANCE WITH NWT WATER BOARD GUIDELINES FOR CONTINGENCY PLANNING, 1987).**

Please refer to the attached Mackenzie Delta Project Emergency Response Plan and Mackenzie Delta Project Waste Management Plan.

- 3.2 ATTACH AN INVENTORY OF HAZARDOUS MATERIALS ON THE PROPERTY (AS DEFINED UNDER TRANSPORTATION OF DANGEROUS GOOD REGULATIONS).**

Please refer to the chemicals list in Appendix B of the attached project description.

- 3.3 ATTACH AN OUTLINE OF PLANNED ABANDONMENT AND RESTORATION PROCEDURES.**

Upon completion of the drilling program, the well(s) will be capped and temporarily or permanently abandoned, and the wellsite, campsite, and fuel storage facilities will have the surface scraped to pick up all contaminated or stained ice & snow. This scraped material will be hauled by gravel truck or sealed container to Swimming Point for consolidation. All equipment will be removed from the site, and survey stakes and construction debris associated with the operations will be disposed of in the Inuvik landfill upon completion of drilling. As a minimum, an electromagnetic survey will be completed the summer following sump closure (summer 2004) to ensure the contents of the sump have not migrated. The only permanent facility planned is the well. Petro-Canada and their contractors will adhere to all applicable regulations and guidelines.

SECTION 4:

ENVIRONMENTAL ASSESSMENT AND SCREENING

Your application and other project details, such as this questionnaire, will be sent out for review by local aboriginal and public groups as well as territorial and federal government agencies. Their comments regarding the significance of project impacts are considered before a decision is made to allow the project to proceed. Because formal assessment and screening of water licences was only initiated in about 1989, applicants will find that this process may be required even if the project has been built and in operation for several years. However, if your project has been previously screened a further assessment may not be required, or a more limited process may be used. This will depend on individual circumstances, including the stage of the project. Some projects may need a higher level of review or submission of more information before being screened.

- 4.1 HAS THIS PROJECT EVER UNDERGONE AN INITIAL ENVIRONMENTAL ASSESSMENT, INCLUDING PREVIOUS OWNERS?

YES X NO

IF YES, BY WHOM / WHEN: Project Description for the Proposed Petro-Canada Nuna Winter 2002/2003 Drilling Program (attached) – Prepared by Inuvialuit Environmental & Geotechnical Inc., July 2002

- 4.2 HAS BASELINE DATA BEEN COLLECTED FOR THE MAIN WATER BODIES IN THE AREA?

YES ☒ NO

IF YES, ATTACH DATA.

Volume estimates for lakes to be used for water withdrawal are provided in Appendix C of the attached project description.

- 4.3 HAS BASELINE DATA BEEN COLLECTED AND EVALUATED WITH RESPECT TO THE BIOPHYSICAL COMPONENTS OF THE ENVIRONMENT POTENTIALLY AFFECTED BY THE PROJECT (WILDLIFE, SOILS, AIR QUALITY).

YES X NO ☐

IF YES, ATTACH DATA.

Please refer to Section 11.0 Environmental Overview in the attached project description.

4.4 ATTACH A DESCRIPTION OF ALL PROPOSED AND EXISTING ENVIRONMENTAL MONITORING PROGRAMS.

Testing of the drilling waste will occur at regular intervals during operations to ensure the contents meet regulatory guidelines. All wastes deposited in the sump will be compatible with these guidelines. The sump will also be monitored for salinity migration using electromagnetic induction in the summer of 2004. Electromagnetic induction measures conductivity of the soils to determine whether the salts in the drilling wastes are migrating through the soil from the sump.

A qualified Inuvialuit Environmental Monitor and an Inuvialuit Wildlife monitor will be employed to monitor operations and ensure that mitigative measures are implemented and environmental and wildlife concerns are addressed as they are encountered. The Environmental Monitor will have appropriate training, experience, and knowledge of the local area to successfully fill this role. It is important that the roles and responsibilities of the Monitor be clearly understood by all crew members. The Environmental Monitor will prioritize her/his activities according to which tasks may have a higher potential to cause adverse environmental impact. It will also be the Environmental Monitor's responsibility to document relevant information for ILA, INAC and Petro Canada.

4.5 HAS A COMMUNITY CONSULTATION PROGRAM BEEN INITIATED?

YES X NO ☐

IF YES, PROVIDE DETAILS OF THE PROGRAM.

Please refer to Section 16.0 of the attached project description.